

Build 19 Information

This is a presentation on the changes in build 19.

Software note numbers

- RPG will be installed per **Mod Note 197**
 - This mod note includes replacing the RPG LAN Switch and Router
- RDA will be installed per **Software Note 164**

Order of installation

- **The RPG MUST be installed before the RDA**
 - Because of the new clutter data being added to the wideband data format, RPG B19 will work with RDA B18.2, but RDA 19 will not work well with RPG B18.2!
 - If the site has enough people, they could load the RPG and RDA at the same time
But they should NOT go to Operate before the RPG load is complete

VCP changes (there are some changes for all sites)

Base Tilt:

The extra low elevation angle below 0.5° that some sites have is now called **Base Tilt**

Here are all 18 sites that will have a Base Tilt after Build 19 deploys

KBUF $+0.3^\circ$	KGJX -0.2°	KMSX -0.2°
KCLE $+0.4^\circ$	KGSP $+0.2^\circ$	KMTX $\pm 0.0^\circ$
KCLX $+0.3^\circ$	KICX $+0.2^\circ$	KMUX $\pm 0.0^\circ$
KDGX $+0.3^\circ$	KLGX $+0.2^\circ$	KRAX $+0.2^\circ$
KDLH $+0.2^\circ$	KMAX -0.2°	KRGX $\pm 0.0^\circ$
KFSX -0.2°	KMBX $+0.3^\circ$	KSHV $+0.3^\circ$

OFFLINE Operate has been removed from the system

Note that the FAA RMS system still has the option

If selected, the RDA will go to Standby

The option will be removed in the next RMS update

PedCal Changes

Correct Droop Setting Calculation

The current Droop Angle calculation has too much dependency on the BAM offset error based on the pointing inaccuracy determined during the test.

At places with large pointing inaccuracy the angle estimate falls into an incorrect region of the sine curves. This can cause a site that needs an upward contribution to receive a downward contribution instead.

Change RCP8 Background Configuration File in Response to Smoother Antenna Motion

A few background parameters for the internal drive control were changed in particular a parameter called the elevation hysteresis was updated as an attempt to better handle potential dithering

Diagnostic Feedback Adjustment for Large Overshoot

The Az and El Diagnostic Feedback tests in Pedestal Calibration have rules prioritizing overshoot size and position settling

When PedCal or Suncheck is run and Update Adaptation Data button is selected, the parameters will be used immediately WITHOUT restarting the RDA

For Redundant sites, don't forget to sync to the inactive channel (see the RDA Adaptation Data Changes section below)

Manually editing PedCal or Suncheck values will still require an RDA software restart (not normally done)

RDA Alarm Changes

Added

Alarm Code 448 RSP INTERNAL HARD DRIVE 'SMART' FAILURE DETECTED

Alarm Code 451 RSP REMOVABLE HARD DRIVE 'SMART' FAILURE DETECTED

Alarm Code 456 SIGNAL PROCESSOR LAUNCH ERROR

Alarm Code 457 RSP COMPONENT OVERTEMP

Alarm Code 458 RSP CMOS BATTERY FAIL

Alarm Code 459 RSP COOLING FAN FAIL

Alarm Code 461 RSP HEALTH MONITORING ERROR

Alarm Code 474 HORIZONTAL NOISE TEMPERATURE LOW

Alarm Code 475 VERTICAL NOISE TEMPERATURE LOW

RDA Alarm Changes

Changed

Alarm Code 555 CHANNEL CONTROL FAILURE - RDAIU SWITCH MISMATCH

Was RDA Control Secondary, Occurrence, & Sample = 1

Now RDA Control Maintenance Required, Edge Detect, & Sample = 1

Alarm Code 19 GPS ANTENNA FAILURE

The actual alarm definition did not change, but the polling interval looking for this alarm change from every 10 seconds to every 300 seconds (5 minutes)

This is to reduce the number of false alarms (i.e., set/clear and set/clear and set/clear)

Note: The GPS is going to be removed, likely in Build 20, and the RDA/RPG will begin using the National Level 2 servers for a time source

System Test Software (STS) Changes

Suncheck Parts 1 & 2 will now log data for V as well as H

ISDP Calibration Scan will now run at elevation angle specified in st01 (currently 0.5° for all sites) instead of the original 0.0° elevation

Power Isolation Test no long updates a023 to 0 during the test

Noise Scale Test no longer forces sp036 & sp049 to 1.0

System Test Software (STS) Changes cont

Receiver Bias Calibration updated to not use bad linearity data

The Receiver Bias calibration reuses measurements taken during the linearity check. Although the linearity check uses self-consistency checks to throw out suspect data points, Receiver Bias ignores the results of those checks and uses the measurements blindly.

This makes receiver bias more vulnerable to mis-calibrating in the face of some types of hardware failures.

The Receiver Bias Calibration will be updated to see if the Linearity Check threw out the data points needed for Receiver Bias and if so, throw an alarm and fail without updating receiver bias in performance maintenance data.

If this error occurs on startup with no previous receiver bias, a receiver bias value should be interpolated from what data can be salvaged from the linearity check or failing that chosen to match the ZDR bias in adaptation data.

System Test Software (STS) Changes cont

Dynamic Range Calibration updated to correctly save the starting point

The dynamic range calibration uses the compression point from the previous calibration cycle to choose where to begin its search.

With recent hardware changes, it is now normal for the compression point to be above the range detectable by this test.

When that occurs, the compression point isn't updated and so in the next calibration sequence Dynamic Range will start its search from the same point.

This can lead to spurious errors fooling Dynamic Range from starting its search farther away from the correct value without a mechanism to correct itself when the errors are gone, increasing calibration and volume times by several seconds.

System Test Software (STS) Changes cont

Hardware Config should now retain device passwords across RDA loads

When PedCal is run and the Update Adaptation Data button is selected, the parameters will be used immediately WITHOUT restarting the RDA software

The same is true for Suncheck

Manually editing PedCal or Suncheck values will still require an RDA software restart

Level 1 Recording

The RDA will now automatically record Level 1 data to the removable hard drive (/dev/sdb2)

Data are stored in subdirectories under /opt/data/tsarchive with 4 hours of data in each subdirectory

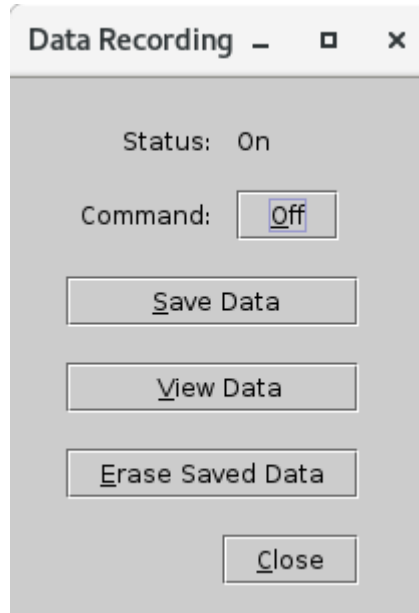
When the removable hard drive is nearly full, the oldest data are deleted to make room for new data files

Typically 4-6 days' worth of data can be stored before they are deleted, depending on the VCP in use

Level 1 Recording

- Recording can be stopped via the Data Recording window on the RDA HCI (see screenshot below)
You do not need to be logged in to the RDA HCI to stop recording

"Level 1 Recording should only be stopped when directed by the ROC to preserve a data case"



Level 1 Recording

Note that this same window can still be used to “save” up to 4GB of data to be written to a DVD at a later time

The data “saved” are from the already saved VCP data, not new VCPs

This window only saves the data to a new location to keep them from being deleted.

To write to DVD, from the RSP, select **Applications, Data Recording, Make Time Series Disk**

If the ROC needs to view this Level 1 data for a particular event, the site will need to stop recording.

A replacement drive along with procedures will be sent from the ROC

Note: This removable drive also holds an RDA Backup so when swapped with the replacement drive from the ROC, the site will want to make a new Backup

RDA HCI Changes

Can now do Advanced Edits (adaptation data) from any RDA HCI, local or remote (e.g., from MSCF)

Will be helpful for st22 updates (Initial System Differential Phase)

The Alarm Log history was increased from 250 to 999 alarms

The RDA HCI account (e.g., orda) password now expires every 90 days instead of 60 days

RDA Adaptation Data Changes: Redundant Only

Several RDA adaptation values can now be sync'd between channels on FAA and NWS Redundant systems via the RDA HCI

Clutter Bypass Map

Via the **Sync Clutter Map** option on the **Channel** menu

PedCal values a036 to a052

Via the **Sync Pedcal/Suncheck Data** option on the **Channel** menu

Suncheck values a014 & a015

Via the **Sync Pedcal/Suncheck Data** option on the **Channel** menu

Next VCP, RxRN, CBT, & EBC settings

EBC enable/disable only, not the EBC correction table as each channel could be different

RDA Adaptation Data Changes

Maximum Transmitter Leaving Air Alarm Temperature (t038) changed from 55 to 42° C

Internal Temperature Alarm Temperature's Adaptation Data were set too wide (e.g. a018 = 0° C, a017 = 45° C).

Test & measurement circuit temperature should remain near 25° C for accurate calibrations.

Engineering has determined from the survey that default AME Internal Temperature alarm thresholds should be 20° C to 30° C. For build 19 a018=20° C and a017=30° C

Unused adaptation data r290 (ZDR Check Failure Threshold), r291 (PHI Check Failure Threshold), & r292 (RHO Check Failure Threshold) have been removed

Stepper Motor Changes

Adaptation Data a026 (RF Pallet Phase Shifter Stepper Motor Enabled) added

Default is True for all sites

When set to False, the software will disable movement of the stepper motor, disable the time out alarm, and grey out menu items in STS that would make the stepper motor move.

There was also a change in software to ensure the stepper motor does not move DURING a VCP

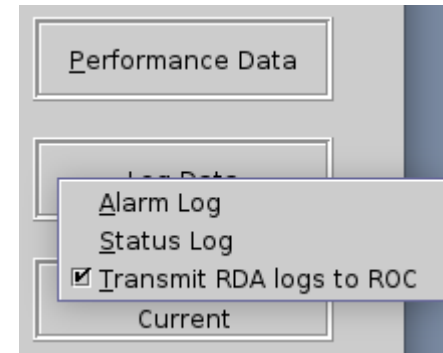
Now, the software should only try to position the stepper motor on channel change, a software start, or under command/calibration in STS

RDA Logs

The RDA will now send select RDA log data to the RPG where they will be packaged and sent in the LDM/Level 2 data stream

This option is on by default

It can be turned off on the RDA HCI by selecting the Log Data and unchecking the Transmit RDA logs to ROC option (see below)



Startup Change

If an INOP alarm occurs during RDA Startup, the RDA will no longer take control

Control will remain “Either”

Performance Maintenance Data Changes

Six (6) new PMD values were added under the Device Status tab to monitor some additional RSP devices

For the IFDR

IFDR Case Temperature

IFDR FPGA Temperature

For the RSP

Internal Drive

Removable Drive

CPU 1 Temperature

CPU 2 Temperature

OS Changes

Log Rotation no longer fails when the radarop account password expires

The RDA can once again write to CD-RW discs

The RDA now has a System Console menu item, just like the RPG

The RDA will no longer automatically virus scan media when it is first mounted

Bug Fixes

In the past, the current adaptation data file (adaptcur.dat) was being truncated at 4k (i.e., everything from tr009 and beyond was deleted from the adaptation file).

This has been fixed

If an RDA software restart is done while the last signal processing action the software took was some kind of calibration (system calibration, performance check, or some tests in STS) and st22 or st23 has changed from what is in use, the software would erroneously use the old value after the restart while reporting the new value.

This has been fixed

RPG Changes

Various Product and adaptation changes

The Update RPG Software GUI will now automatically eject the CD when the update is completed for all types of update CDs (e.g., point builds)

"A CD now fully ejects when pressing the manual eject button on the CD drive"

The RDA HCI displayed at the MSCF can now modify RDA adaptation data

The RDA HCI login is still required

So now ST22 can be changed without going to the RDA shelter

(ST22 = Initial System Differential Phase)

RPG Changes

cont

Data Quality Dashboard (DQD) Changes:

The initial DQD page now includes a method to estimate the error in QPE accumulations based on the current RPG ZDR Bias estimate

This estimate is also based on the currently select QPE equation (Continental or Stat/Trop) from adaptation data and a user-selectable reflectivity value

DQD also now has an “About” page with detailed information on how the shade charts are generated and how to interpret the information

OS Changes

As listed at the start of this document, the RPG Router and LAN Switch are replaced as part of the Build 19.0 install procedure via Mod Note 197

Build 19.0 will also support the new MSCF computer

This computer will ship after Build 19.0, so the software supports both the old and new computer

Will be installed per Mod Note 218

Load procedures are slightly different so 6-520 has load instructions for both

New computer loads Build 19.0 in 15-20 minutes!

Hardware Config should now retain device passwords across RPG loads

LDM/Level 2 Changes

The RDA will now send select RDA log data to the RPG where it will be packaged and sent in the LDM/Level 2 data stream

ROC will collect the data for viewing in near real-time

- It takes ~5 minutes for messages to leave the RDA and be viewable on ROC systems

The following RDA Logs are sent to the RPG & ROC

- RDA Log
- Error Log
- Offline Test (STS) Log
- AZ Servo Log (new to Build 19)
- EI Servo Log (new to Build 19)

Misc Changes

RPG can now write to blank DVD+R discs

It can also still write to DVD-R and CD-R

You can no longer connect to the LAN Switch, Router, or Hub Router via telnet and instead must use ssh

Note you have to include the username in the command as in

ssh operator@rtr1 (can do from MSCF or RPG)

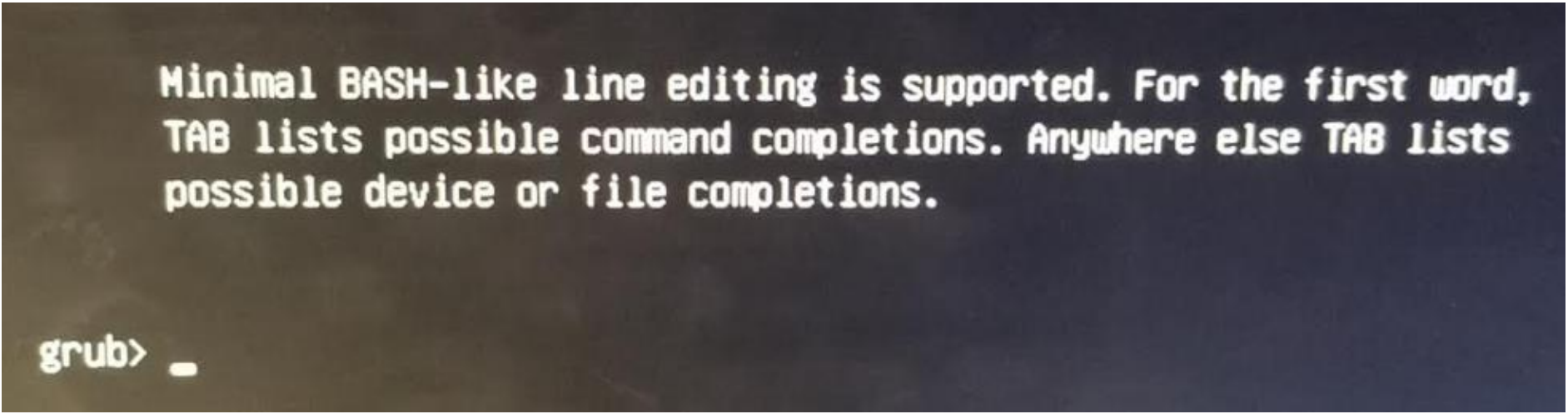
ssh operator@lan1 (can do from RPG only)

ssh operator@frhubtr (can do from MSCF or RPG)

New MSCF Install

At Attachment 1, Step 12 you select a specific hard drive and press <Enter>

However, if you click OK with the mouse instead, the load will fail with the following error being displayed

A screenshot of a GRUB terminal window with a dark blue background and yellow text. The text reads: "Minimal BASH-like line editing is supported. For the first word, TAB lists possible command completions. Anywhere else TAB lists possible device or file completions." In the bottom left corner, the prompt "grub> _" is visible.

Minimal BASH-like line editing is supported. For the first word,
TAB lists possible command completions. Anywhere else TAB lists
possible device or file completions.

grub> _

There is a CAUTION note just above Step 12 that explains this and instructs folks to start again at Step 9.